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MARKETING PRACTICES OF WEST VIRGINIA LUMBER PRODUCERS

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Bulletin 507 June 1965

WEST VIRGINIA UNIVERSITY
AGRICULTURAL EXPERIMENT STATION

THE AUTHORS

D. E. Nelson, Instructor in Wood Technology, Division of Forestry, and a former Research Assistant in the Agricultural Experiment Station, is working on his doctorate in forestry at the University of Michigan; W. W. Christensen and W. H. Reid, both former Associate Foresters in the Experiment Station, are now with the U. S. Forest Service; N. D. Jackson is Assistant Forester in the Experiment Station.

West Virginia University Agricultural Experiment Station
College of Agriculture, Forestry and Home Economics
A. H. VanLandingham, Director
Morgantown

1965-66

West Virginia University

Mountaineers

GYMNASTICS

Captain Ken Musko and Coach Bill Bonsall

CHAMPIONS
NCAA SOUTHERN DISTRICT
1965

Facts About The WVU MOUNTAINEERS

LOCATION .....Morgantown, W. Va. 26506
FOUNDED ..... February 7, 1867 (98th year
ENROLLMENT 11,514 (1965-66
NICKNAME ..... Mountaineers (NOT "mounties"
COLORS ..... Old Gold and Blue
CONFERENCE ..... Southern (July 1, 1950
PRESIDENT ..... Paul Ausborn Miller '3
ATHLETIC DIRECTOR .... Robert N. "Red" Brown
GYMNASTICS ..... William Bonsall
PUBLICITY DIRECTOR ..... Edgar Barrett
ASST. PUBLICITY DIRECTOR ..... Roger Ruhl
(In charge of gymnastics)

OUTLOOK

The best gymnast in West Virginia history has graduated, but the Mountaineers still figure to keep on winning.

Coach Bill Bonsall, now in his 14th year as coach, is gunning for his fifth straight winning season. His recent prosperity followed nine years without a winning season. Bonsall's career record is 35-47-1, but his teams have won 23 while losing only nine over the last four seasons.

To keep winning Bonsall must replace Jerry Spencer, the man he called "one of the ten best gymnasts in the country" last year. Spencer accounted for 316 points a season ago, more than half of the team's total. In one dual meet he captured every first place and scored 84 points.

Four men return from last season's team which finished 6-2 and took the NCAA Southern district championship. Captain Ken Musko in the only senior. Juniors Bob Rajchel and Jack Carter are the top returning scorers. Mike Knaggs, a specialist on the still rings, also returns.

A pair of all-around sophomores move up to the varsity and both have the potential to blossom into outstanding performers. Eddie Cross won three gold and three silver medals in the Western Pennsylvania Regional Invitational and captured the meet's all-around event last year. Bonsall calls him and Ed Ehler "welcome additions" to this year's weakened team. Other newcomers to the team include Jim Bays, Ron Curfman, and Danny Deems.

ROSTER

Name	Event	Hometown
ı Bays	Free Exercise Parallel Bars	Allentown, Pa.
:k Carter	Horizontal Bar	Westbury, N.Y.
Cross	All Around	Parkersburg
n Curfman	All Around	Parkersburg
nny Deem	Parallel Bars Still Rings	Parkersburg
Ehler	All Around	Wheeling
ce Knaggs	Still Rings	Elkins
n Musko	All Around	Butler, Pa.
b Rajchel	All Around	Butler, Pa.

SCHEDULE

:c.	11	Virginia at Charlottesville
n.	8	Western Reserve, Kent State at Cleveland, O.
n.	15	VMI at Morgantown
:b.	2	Merchant Marine at New York, N. Y.
:b.	3	Coast Guard at New London, Conn.
:b.	5	William and Mary at Williamsburg, Va.
:b.	19	Eastern Michigan, Slippery Rock at Slippery Rock, Pa.
:b.	22	Pitt at Morgantown
ır.	4-5	Southern Intercollegiate Championship at Furman University, Greenville, S. C.
ır.	18-19	U.S.G.F. Championships at Slippery Rock, Pa.
ır.	1-2	NCAA Championships at Penn State, University Park, Pa.

1964-65 RESULTS
(Won 6, Lost 2)

30	Penn State, away	66
63	Virginia, home	31
70	Chicago, home	50
55½	Georgia Southern, home	40½
56½	Slippery Rock, away	47½
76	Ithaca, away	20
35	Pitt, away	61
59½	Georgia Tech, home	37½

1st – NCAA Southern District Championships

ALL-TIME SERIES RECORDS

Team	Began	Won	Lost	Tie
Army	1957-58	0	1	0
Ball State	1960-61	2	1	0
Chicago	1960-61	3	0	0
Citadel	1963-64	1	0	0
Cortland	1961-62	2	0	0
Duke	1952-53	0	1	0
Georgia Tech	1956-57	3	1	0
Georgia Southern	1963-64	1	1	0
Illinois State	1962-63	1	0	0
Illinois (Chicago)	1954-55	0	2	0
Ithaca	1961-62	2	0	0
Lock Haven	1955-56	3	1	0
Massachusetts	1958-59	0	1	0
Michigan	1959-60	0	1	0
Navy	1955-56	0	5	0
North Carolina	1952-53	0	2	0
Ohio State	1953-54	0	5	0
Penn State	1953-54	0	9	0
Pitt	1953-54	4	10	0
Slippery Rock	1960-61	4	1	0
Springfield	1958-59	0	1	0
Temple	1955-56	0	3	0
Virginia	1962-63	3	0	0
West Chester	1954-55	5	1	1
Western Illinois	1962-63	1	0	0
Totals		35	47	1

SEASON BY SEASON

Year	Won	Lost	Tied	Coach
1952-53	0	2	0	Bill Bonsal
1953-54	2	3	0	Bill Bonsal
1954-55	3	3	0	Bill Bonsal
1955-56	0	7	0	Bill Bonsal
1956-57	2	4	0	Bill Bonsal
1957-58	2	4	0	Bill Bonsal
1958-59	1	5	0	Bill Bonsal
1959-60	1	6	0	Bill Bonsal
1960-61	1	4	0	Bill Bonsal
1961-62	4	3	1	Bill Bonsal
1962-63	8	1	0	Bill Bonsal
1963-64	5	3	0	Bill Bonsal
1964-65	6	2	0	Bill Bonsal

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Summary

The market for lumber from sawmills is not a competitive market. In a competitive market prices for a certain product are related to costs, but market imperfections in the lumber market allow buyers (and, infrequently, sellers) to practice price discrimination. This results in a variety of prices for the same product—an imperfect market. The objective of this study is to describe the market for lumber in West Virginia, with particular attention to possible causes for market imperfections.

A random sample of West Virginia lumber producers who market lumber was selected for personal interview. The 133 producers interviewed marketed about one-third of the estimated 405 million board feet of lumber marketed in West Virginia in 1957.

Three size classes were recognized. Small firms marketed less than one-half million feet per year. Medium-size firms marketed over one-half but less than three million board feet. Large firms marketed three million or more board feet. The data on marketing practices indicate that there are substantial differences between firms, and that the small firms are at a particular disadvantage.

Firms which marketed lumber also produced other wood products. Small firms produced greater volumes of other wood products than they did lumber—mostly low-value products such as mine timbers and railroad ties. Large firms produced mostly lumber, some mine timbers, and considerable volumes of such high-value products as flooring and dimension stock.

Not all of the lumber marketed by the firms in this study was produced by them. Some of the larger firms assumed a wholesaler's role by purchasing lumber and then reselling it along with the lumber they produced. Lumber purchases for resale were most common with the large firms, where almost 10 per cent of the lumber sold had been purchased. Smaller firms handled a smaller percentage in this manner.

Total lumber marketed by West Virginia firms in 1957 was an estimated 405 million board feet, of which only 34 million board feet was softwood. Oak and yellow-poplar accounted for two-thirds of the hardwood lumber. Hemlock was by far the most common softwood. The bulk of the lumber marketed was hardwood in air-dried condition and in rough form. A considerable amount of green hardwood lumber was marketed, especially by the smaller firms.

Over 200 million board feet of West Virginia hardwood lumber was marketed out-of-state, primarily in Virginia, North Carolina, Pennsylvania, and Ohio. A large volume of the more desirable species and better grades is used in the manufacture of furniture by firms outside the State.

Much of this lumber was supplied by large firms. The principal product manufactured within the State was oak flooring, produced from low-grade lumber supplied by the smaller firms.

The smaller firms marketed a higher proportion of the poorer grades of lumber than did the large firms. Twelve per cent of the hardwoods was sold as ungraded lumber.

The largest initial market outlet for lumber was the manufacturer, followed by the wholesaler, the consumer, and the retailer. Wholesalers dealt mainly with the better grades. It is reasonable to assume that much of the lumber handled through wholesalers was resold to manufacturers. Furniture and flooring accounted for over 70 per cent of the lumber marketed to manufacturers.

Prices paid by buyers to West Virginia lumber producers were generally less than the accepted market price. Large firms, for example, were paid prices near the accepted market price, but small firms received an average of $60.00 per thousand board feet less than the large firms did for the better grades of lumber. This trend was present for all grades and all species. Firms selling through wholesalers were not so likely to receive as high a price as those selling through manufacturers, but the average price paid by manufacturers was only slightly higher than the average price paid by wholesalers. Large firms which sold to wholesalers received higher prices than did small firms for the same product.

The firms which spent time locating markets for their lumber received higher prices than those firms which did not. When the price of the lumber was determined by bargaining, it varied according to which party was in the stronger bargaining position. The seller's price approached the accepted market price; the buyer's price was considerably lower; and the compromise price fell in between. Small firms were often forced to sell at the buyer's price because they lacked bargaining power.

Most lumber sellers demanded cash payment within 30 days. Small firms favored the buyer who offered the best price, paid cash on delivery, would buy all grades, and would buy when the market was poor. Large firms favored the buyer who represented reputable firms. Large firms measured and graded the lumber they sold, while many small firms were forced to sell at a price based upon the buyer's determination of grade and lumber volume.

Small firms were often forced to sell green lumber in order to pay current operating expenses. For many, severe capital limitations precluded the holding of the large lumber inventories needed in order to yield additional revenue through the sale of air-dried lumber. Larger

firms, normally without this capital limitation, maintained sufficient lumber inventories to capitalize on the higher price paid for air-dried lumber. They also used their inventories as an indication of market conditions. When markets were good, inventories decreased, and production was accelerated to compensate. When markets were poor, inventories increased and production was cut back. The firms with abundant capital could wait for a favorable market price, while those without capital were forced to sell regardless of the market conditions.

The market for West Virginia lumber does not approach the "ideal" market in which there is a single price for a standard product. As long as there is such a great difference in size between firms and such a serious lack of capital by producers, there will be different bargaining positions, resulting in price differences. The bargaining position of smaller producers, however, can be improved by stronger marketing effort, cooperative marketing, widespread price reporting, and the help of federal or state marketing specialists, and extension personnel. Marketing publications like this can only indicate the extent of the market imperfections. Other public or private institutions may wish to consider actual solutions.

Marketing Practices Of West Virginia Lumber Producers

D. E. Nelson, W. W. Christensen, W. H. Reid, and N. D. Jackson

Introduction

Manufacture of lumber implies sale of lumber, therefore lumber producers must be marketers of their product as well as producers. Although considerable literature is available on the production of lumber, surprisingly little exists on the marketing of this product. This bulletin reports on the marketing practices of West Virginia producers who market lumber. The few producers who do *not* market lumber either manufacture a product other than lumber, or custom-saw logs not owned by them. These producers are excluded from this report.

During the present century, West Virginia has been one of the nation's leading producers of hardwood lumber. Since 1900, for example, the State has ranked first annually on fifteen occasions.* During the period 1900 to 1957, an estimated 28 billion board feet of hardwood lumber was produced in the State—about 8 per cent of the total national production. Almost half of this production was oak lumber.

Some indication of how this huge volume of lumber was utilized is contained in a 1914 report by Nellis and Harris (1914). This study was conducted to ". . . determine the extent to which lumber is further manufactured within the State of West Virginia." This report listed products of West Virginia's wood-using industry, stating that for the year 1912 about 250 million feet of the 1,250 million feet produced was re-manufactured into products within West Virginia. That "West Virginia's wood-using industries are not highly developed, and a large part of its lumber is being sent away from home to be further manufactured" is a situation which is true even today.

*The years in which West Virginia ranked first in hardwood lumber production are 1907, 1910, 1911, 1912, 1913, 1914, 1915, 1916, 1917, 1932, 1939, 1940, 1941, 1942, and 1946. The peak production year was 1909, when 1,524 mills cut 908 million board feet of hardwood lumber. The 1958 hardwood production figures show West Virginia as ranking tenth in the nation, behind Virginia, Tennessee, Mississippi, North Carolina, Arkansas, Louisiana, Pennsylvania, Alabama, and Missouri, in that order Hardwood lumber production in 1958 was 285 million board feet in West Virginia. (Data from H. B. Steer, Lumber Production in the U.S. 1799-1946. USDA Misc. Publ. No. 669, and U.S. Bureau of Census, Current Industrial Reports Lumber Production and Mill Stocks, 1959 and 1958 Series M24T(59)-1, Washington 25, D. C. 1961.)

Both lumber production and lumber re-manufacturing in West Virginia have decreased since 1912; at present an estimated 60 million feet of lumber is manufactured into products within the State, compared with 250 million in 1912 (Reid and others, 1961).

When centers of lumber production are remote from centers of manufacturing, producers are often forced to rely upon market intermediaries to perform the marketing function. In this case, the returns to the producer may be lower because of lack of knowledge as to better alternative markets for this lumber. This problem is especially true for West Virginia since a majority of the wood-using industries are located at considerable distances from the State's sawmills.

Research Procedure

The marketing information on which this bulletin is based was obtained through personal interviews with a large number of West Virginia sawmill owners who were producing lumber for market. These owners were selected at random after stratifying the universe of mill owners both geographically by counties and by mill-size class within selected counties. A total of 133 sawmill owners was sampled of the 604 which composed the universe.

Twenty-two large-mill ownerships accounted for over 40 per cent of the total lumber volume marketed (Table 1). The medium-size mills, totaling 162 units, accounted for another 40 per cent of the lumber market, leaving less than 20 per cent of the market for the remaining 70 per cent of the mills—those with an annual production of less than one-half million board feet.*

Because sampling percentage varied within the three size-class strata, a blow-up factor was computed for each of these classes. This factor was based upon the number of mill ownerships in each size class. Most of the data contained in this report is the estimated total derived from the blown-up data, which permits more valid comparisons between the three size-classes of mills. When actual sample data is presented, it will be designated as such.

Composition of the Sawmill Industry

During the past fifteen years, the number of sawmills in West Virginia has decreased from 1,558 (Steer, 1948) to 824 (West Virginia University, 1959). Most of this reduction has occurred in the inefficient small-mill category. There is, however, evidence of a continued entrance

*Size classes used in this analysis are: Small mills—marketing from 1,000 board feet to 499,000 board feet annually; Medium mills—marketing from 500,000 board feet to 2,999,000 board feet annually; Large mills—marketing 3,000,000 or more board feet annually.

of new firms into the industry. For example, although all of the large firms surveyed reported that they had been in business for more than five years, over 10 per cent of the small firms in this survey indicated that they had started production within the last five years. Additionally, nearly 5 per cent of the medium-sized firms had also entered business during this period. However, many of these new entrants represent new management of already existing mills. Viewed from a profit standpoint, the future of these new firms appears questionable, particularly for those in the small-size mill class. Many mills of this size have been buying logs F.O.B. mill for an average price of $44.00 per thousand board feet (West Virginia Forest Products Market Information, 1960) and selling lumber, mainly as ungraded, for $60.00 per thousand board feet (Table 5). Assuming that milling costs average $12.50 per thousand board feet (Forest Products Price Bulletin, 1962), a margin of $3.50 per thousand board feet has been realized, which is equal to a $14.00 per day return for mills cutting 4,000 board feet per day. However, if a reasonable charge were made to cover depreciation of the fixed investment, it is likely that a net loss would result.

Although some small mills have been forced to close, many remain in production. The output of lumber is not concentrated in a few large firms. Lumber production is among the very least concentrated industries in the nation. Primary aluminum production, for example, is entirely controlled by only three companies. Total production of the largest twenty sawmill and planing mill companies accounts for only 18 per cent of total U. S. output (Zaremba, 1963). This means that no single company is large enough to influence the national price for lumber. With respect to industry concentration the lumber industry is a good example of free competition. This seems to indicate that there is a place for the efficient small producer in the industry, provided that economies of scale in lumber production do not rule out the small sawmill.

The wide range in annual production which exists between mills seems to indicate that there is no optimum-size mill for all areas. Some West Coast mills cut over 200 million board feet of lumber annually (Lumberman, April, 1959), which is equal to about one-half of the total cut in West Virginia. The largest mill in West Virginia cuts between 15 and 20 million board feet annually (Lumberman, May, 1959), while the vast majority of mills in West Virginia cut less than one-half million board feet per year. Some of these small mills are able to make a profit even though they may be competing against mills fifty times larger. Apparently the nature of this industry is such that economies of scale from a production standpoint are sometimes offset by dis-economies of supply, so that mills can be competitive over a fairly wide range of sizes.

The present trend is toward the medium-size, automated mill.

Table 1 presents sampling and lumber marketing data for the sawmills covered in this study.

Types of Products Produced by Sawmills

Sawmills which produce lumber for the market also produce some other products. In this study, lumber was defined as any wood sawed from logs eight feet and longer in length, yielding boards having two parallel plane faces that measure, in the least dimension, 4 inches or less in softwoods and 6 inches or less in hardwoods. This does not include railroad ties, mine timbers, and industrial blocking. Under this definition, lumber accounted for over 62 per cent of the total volume of products produced by West Virginia mill owners who market lumber.*

Table 2 summarizes the types of products produced by the sampled mills. All sawmill products produced at these mills were converted to board foot equivalents to permit a comparison of the relative importance of the various types of products.

Table 2 shows that almost half of the total product output of the small sawmills was in the production of mine materials. Flooring comprised slightly over 7 per cent of total product output, considerably more than that of the medium mills. However, this apparent inconsistency arises because the small sawmill class included the flooring production of one large flooring mill which sold a small amount of lumber in the reporting year and was therefore placed in the class of mills which marketed small amounts of lumber. If the classifications had been based upon lumber volume *produced* rather than the volume of lumber *marketed,* this particular flooring mill would have been included in the large mill-size class, since it produced millions of board feet of lumber, all of which was subsequently converted into flooring.

Mine materials and railroad ties were less important products for large mills than for small mills. Such bulky, low-value products are typically sawn from low-grade logs—a process requiring little in the way of specialized equipment. These low-value products cannot be hauled long distances at a profit and, consequently, are usually processed by the small mills located near this type of product market. By contrast, manufacture of flooring and dimension stock requires more expensive, specialized equipment. Moreover, these higher-value products can be profitably shipped over longer distances.

*Throughout this bulletin the terms "West Virginia mill owners," "lumber producers," and "sawmills which produce lumber for the market," are all used somewhat interchangeably. To be included in this study, a producer was defined as one who sold at least two-thirds of the total lumber handled by his firm annually.

TABLE 1
Sampling and Lumber Marketing Data for West Virginia Sawmill Owners Who Market Lumber
(Excluding mills with less than 1 M* annual production)

Marketing Data	Small Firms	Medium Firms	Large Firms	Total
(1) Range in annual volume of lumber marketed	1 M-499 M	500 M-2,999 M	3,000 M and over	1 M and over
(2) Number of firms in universe	420	162	22	604
(3) Per cent of total firms $\frac{(2)}{\text{Total (2)}} \times 100$	69.6	26.8	3.6	100
(4) Number of firms in randomly-selected sample	77	46	10	133
(5) Per cent of firms sampled $\frac{(4)}{(2)} \times 100$	18.3	28.4	45.4	22.0
(6) Blow-up factor, by number of firms $\frac{(2)}{(4)}$	5.45454545	3.52173913	2.20000000	4.54135338
(7) Lumber marketed in 1957, by firms included in the sample	13,209 M	46,151 M	77,509 M	136,869 M
(8) Per cent of 1957 sample total $\frac{(7)}{\text{Total (7)}} \times 100$	9.7	33.7	56.6	100
(9) Estimated 1957 total lumber marketed (7) × (6)	72,050 M	162,532 M	170,520 M	405,173 M
(10) Per cent of 1957 total $\frac{(9)}{\text{Total (9)}} \times 100$	17.8	40.1	42.1	100

*M is the standard symbol for 1,000 board feet.

TABLE 2

Quantity of Products Produced by the 133 Sawmills Sampled

Quantity of Production	Lumber	Mine Materials	Flooring	Dimension	Rail and Switch Ties	Other	Total
			Small Firms				
Number of Producers	77	54	2	.....	15	1	77
Volume Produced*	16,969	21,559	3,245	.....	2,294	500	44,567
Per Cent of Total Production	38.0	48.4	7.3	.....	5.2	1.1	100.0
			Medium Firms				
Number of Producers	46	25	1	.....	7	3	46
Volume Produced*	46,712	13,525	240	.....	826	2,319	68,622
Per Cent of Total Production	73.4	21.3	0.4	.....	1.3	3.6	100.0
			Large Firms				
Number of Producers	10	2	3	3	2	2	10
Volume Produced*	81,177	640	14,000	6,500	940	1,500	104,757
Per Cent of Total Production	77.5	0.6	13.4	6.2	0.9	1.4	100.0
			Total All Firms				
Number of Producers	133	81	6	3	24	6	133
Volume Produced*	144,858	35,374	17,485	6,500	4,410	3,419	212,946
Per Cent of Total Production	68.0	16.6	8.2	3.1	2.1	2.0	100.0

*1 M bd. ft.

Lumber Production by Ownership Type

Of the 133 mills in the study, all but ten processed their own logs. Nine mills, eight of which were in the small class, custom sawed logs belonging to other persons, but the total volume which was custom sawed amounted to less than one-half of 1 per cent.

Lumber Marketed

The volume of lumber marketed by any sawmill owner consists of the volume sold from his own production plus the lumber volume that may have been purchased for resale. This wholesaleing function occurred mainly in the large size-class firms. However, the purchase and resale of lumber comprised only 10 per cent of the total lumber marketed by these large units. Of the total lumber they marketed, small firms purchased 2 per cent and medium firms purchased 4 per cent. More than 93 per cent of the lumber marketed in this study was manufactured by the sawmill firm that sold it.

The characteristics of the raw material, or the resulting products, affect the marketing practices of firms. For example, hardwood lumber typically flows through different marketing channels than softwood lumber, primarily because hardwoods usually are destined for a manufactured product of one form or another, whereas softwoods are channeled predominantly into the construction field. As might be expected in a state that principally supports hardwood timber growth, this study shows that of the 405 million board feet of lumber marketed, only 34 million feet was softwood lumber. Over half of the mills in West Virginia did not market any softwood lumber.

Form of Lumber Marketed

The term "form," as used here, refers to the surface condition of lumber marketed, i.e., lumber sold as rough lumber or as dressed or planed lumber. As shown in Figure 1, less than one-tenth of the hardwood lumber was sold in dressed form, and by way of contrast, almost one-half of the softwood lumber was so marketed. But for both species groups, more of the dressed lumber was marketed by large firms, principally because it is the large mills which have the necessary machinery for the surfacing operation.

Only small amounts of hardwood lumber are marketed in dressed form, probably because most of the end uses for hardwood lumber demand machining to precise manufacturer's dimensions. Such specifications are difficult to meet without well-kiln-dried lumber and special surfacing equipment specifically designed for surfacing short, relatively

clear pieces. For this reason, manufacturers who use hardwood lumber prefer to purchase it in a green or air-dried condition and in rough form. As the initial step in manufacturing, the lumber is dried to the moisture content best suited to a particular product; the rough boards are crosscut into relatively clear pieces; and one true, plane surface is established by passing the piece through a special jointer.*

Some soft hardwoods, yellow-poplar (*Liriodendron tulipifera,* L.) and basswood (*Tilia americana,* L., or *T. heterophylla,* Vent.), are sometimes surfaced and used much as construction softwoods would be used. Some dense hardwoods are surfaced on a conventional planer when intended for use in low-valued products like pallets or crating, where the surface qualities are not as demanding as in most manufactured products made from hardwood.

Condition

Condition of lumber refers to its moisture content, i.e., whether or not the lumber is in a green state, has been air seasoned at the mill yard, or has been kiln dried. Condition is shown graphically in Figure 2.

As revealed in Figure 2, hardwoods were mainly sold in an air-dried or green condition, because the users of hardwood often prefer to control the moisture content themselves. Furthermore, even if lumber is dried at the mill to a proper moisture content, there is the possibility that this moisture content may change excessively during handling and shipping operations. Figure 2 also shows that only the larger marketing size classes sold kiln-dried lumber. This is as might be expected because the smaller firms typically do not process and market lumber in sufficient volume to justify a kiln installation. Although well-air-dried lumber commands a better price on the market, the small firms sold a large proportion of their lumber in green condition, probably because they were unable to afford holding the large inventories needed to capitalize on the delayed returns which accompany air drying.

Air-dried or green softwoods are satisfactory for many construction uses. The large West Coast producers of softwood lumber often kiln dry,

*The jointer used to surface hardwood for manufactured products is not the same type used to surface softwood construction lumber. In surfacing softwood lumber for construction, the board is flattened by the pressure exerted by the planer feed rollers as it is surfaced. The resulting surface is smooth but most of the original cup is still present in the board after surfacing. For construction, this is not too objectionable because much of this cup can be removed in the construction by nailing. When pieces of rough hardwood boards are surfaced they are held down on the planer table at many points by spring loaded fingers which exert little pressure, so that the resulting surface is a true, plane surface. It is not possible or desirable to do this for an entire board. If a sawmill were to produce pieces of the type described, it would be in reality producing dimension stock.

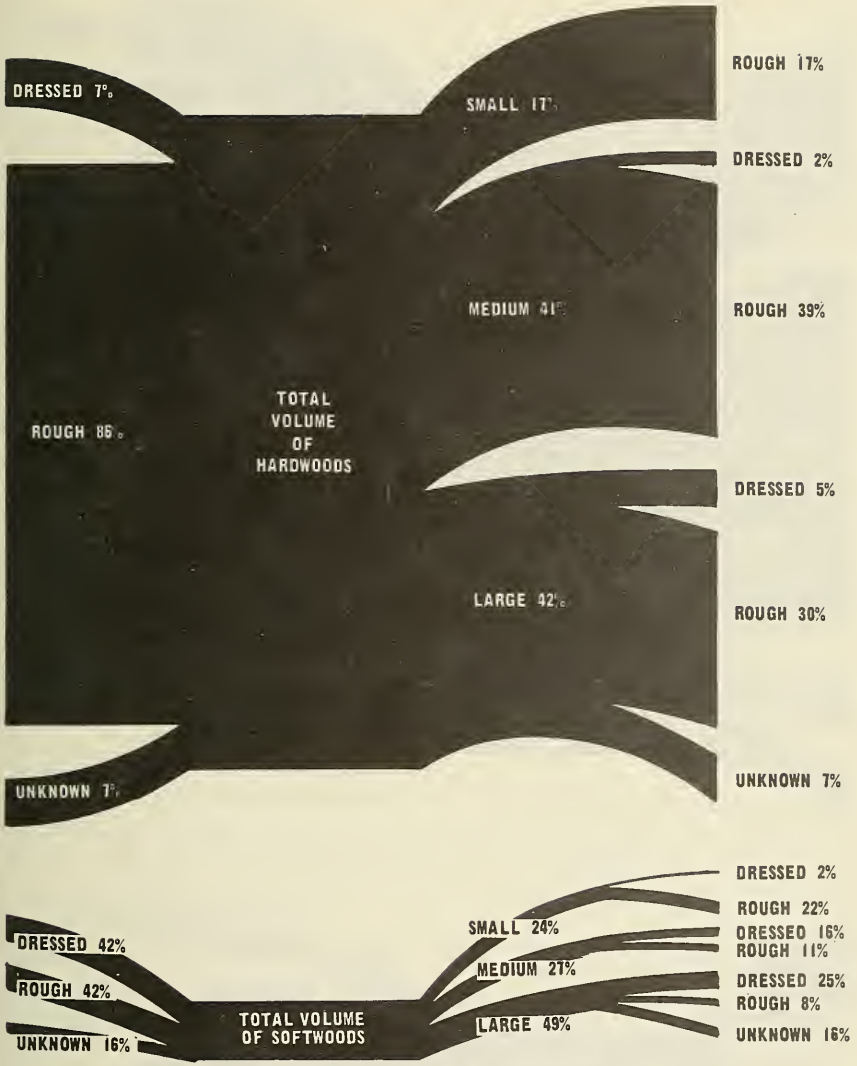


FIGURE 1. Form of lumber marketed by mill size.

but this is sometimes done to reduce shipping weight and inventories, rather than to improve the product.* Where softwoods are to be used

*At this writing, adoption of the American Lumber Standards Committee's proposed revision to the softwood lumber standards is being considered by the U. S. Department of Commerce. This proposed standard specifies that softwood lumber has a "maximum" moisture content of 19 per cent. Well-air-dried lumber, by contrast, can become as dry as 12-14 per cent, in which case it would be better for construction than kiln dried to a maximum of 19 per cent.

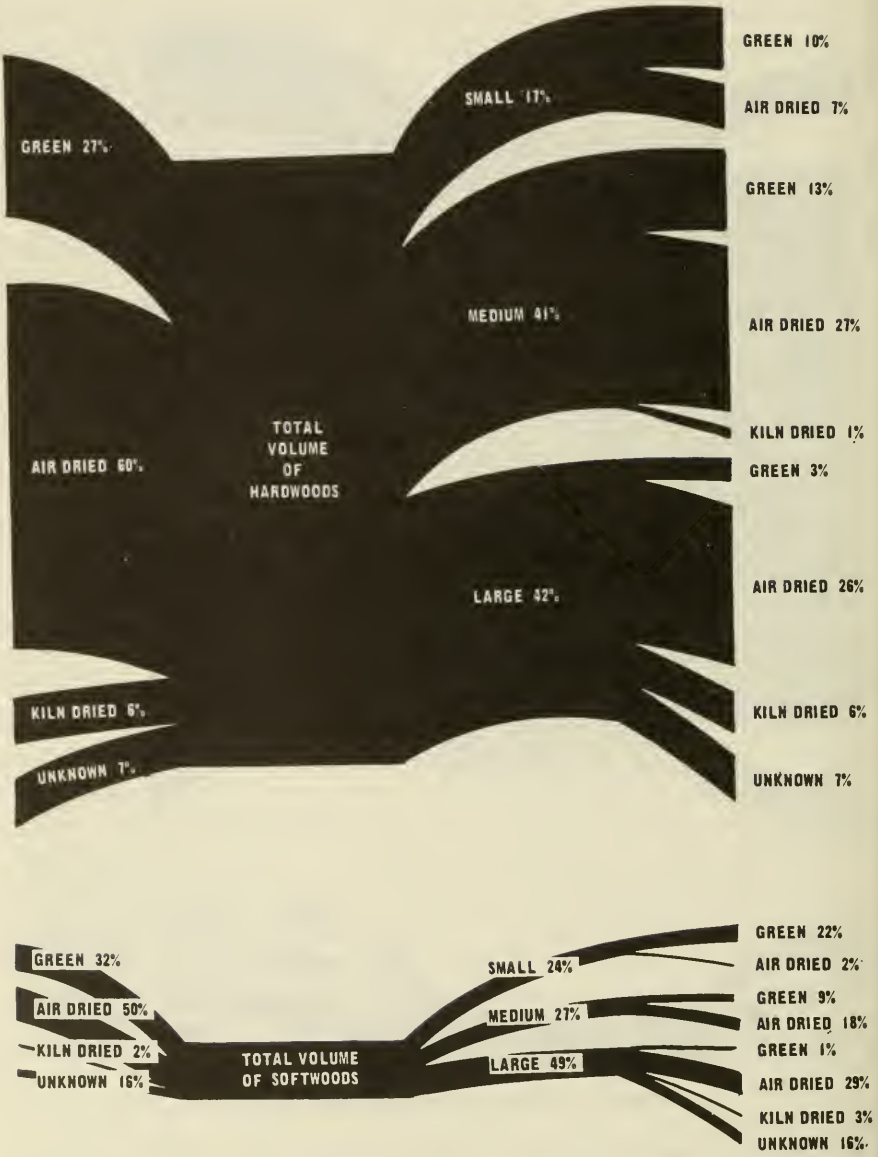



FIGURE 2. Seasoning condition of lumber when sold.

locally for construction, well-air-dried lumber is often drier than kiln-dried lumber from the West Coast. Green softwoods can be used satisfactorily in pallets and crates and in some types of building construction.

Species Groups

Figure 3 shows that almost two-thirds of the hardwood lumber marketed was oak (*Quercus* spp.) and yellow-poplar. These species groups accounted for about three-fourths of the lumber marketed by the small and medium mills. A fair amount of maple (*Acer* spp.) and birch (*Betula* spp.) was marketed—mostly by the larger firms.

Hemlock (*Tsuga canadensis* [L.] Carr.) was the most common softwood, accounting for over 40 per cent of the total softwood lumber. White pine (*Pinus strobus* L.) and one of the southern yellow pines (*Pinus echinata* Mill.) were the only other softwoods marketed in fairly large volume.

Over the past fifty years there have been some changes in the species production of lumber in West Virginia. Oak, for example, was the leading species group in 1907, followed by hemlock. Spruce (*Picea rubens,* Sarg.) was third, yellow-poplar fourth, and chestnut (*Castanea dentata* [Marsh] Borkh.) was fifth. Each of these species groups accounted for over 100 million board feet of lumber produced in 1907 (Steer, 1948). In 1957, oak was the only species group which accounted for over 100 million board feet, followed by lesser amounts of yellow-poplar, maple-birch,* hemlock, white pine, cherry (*Prunus serotina,* Ehrh.) and southern yellow pine, respectively.

Geographical Destination

Much of the lumber produced in West Virginia is marketed outside of the State. Figure 4 shows that nearly 60 per cent of the hardwood lumber moved to out-of-state outlets. The proportion moving out-of-state was greatest from the large mills. Large markets were generally unavailable within the State.

Of the 34 million board feet of softwood lumber produced in West Virginia, less than 5 million board feet was marketed out-of-state. The lumber going to out-of-state outlets was marketed mainly in the border states of Virginia, Pennsylvania, Maryland, and Kentucky.

Geographic distribution of hardwood lumber marketed by West Virginia manufacturers is listed by state destination in Table 3. Virginia, North Carolina, Pennsylvania, and Ohio were the most important markets for West Virginia lumber. Percentages shown in Table 3 are based on a total of 217 million board feet of lumber marketed out-of-state. This total does not include the amount of hardwood lumber marketed as unknown in regard to geographical destination, although it is very likely that much of this lumber also follows the pattern shown in Table 3. That

*This study grouped maple and birch into one species group.

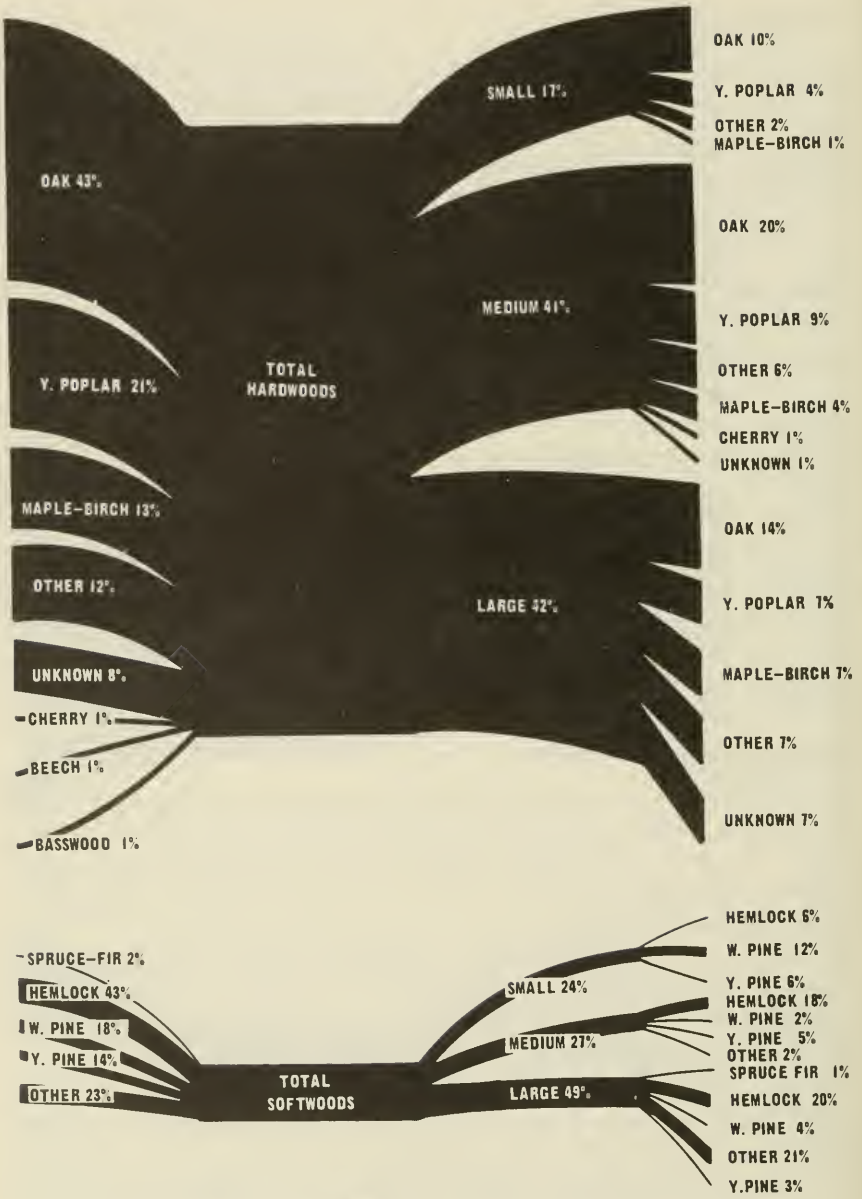


FIGURE 3. Hardwood and softwood lumber marketed by species and mill size.

nearly 40 per cent of the lumber marketed was undesignated as to a specific state suggests that many West Virginia producers did not know the *final* out-of-state destination of the lumber they sold.

TABLE 3

Destination by State of Hardwood Lumber Leaving West Virginia According to Type of Outlet, 1957

(Figures given are percentages of the 217 million board feet marketed out-of-state)

State Destination	Whole-sale	Retail	Manu-facturer	Con-sumer	Other†	Unknown	Total
Unknown*	?	?	?	?	?	38.1	38.1
Virginia	1.8	0.2	13.3	0.1	0.1	-----	15.4
North Carolina	3.4	-----	6.9	-----	0.4	-----	10.7
Pennsylvania	4.4	-----	1.3	2.2	2.5	-----	10.4
Ohio	2.8	-----	1.1	3.5	2.4	-----	9.8
New York	2.1	0.1	1.3	-----	0.6	-----	4.2
Maryland	0.3	0.3	1.8	1.2	0.1	-----	3.6
Illinois	1.4	-----	0.3	-----	-----	-----	1.7
Tennessee	0.2	-----	1.2	-----	0.1	-----	1.5
Massachusetts	0.7	-----	-----	-----	0.6	-----	1.3
Michigan	0.6	-----	0.1	-----	-----	-----	0.7
Missouri	0.6	-----	-----	-----	-----	-----	0.6
West Coast	0.4	-----	0.5	-----	-----	-----	0.9
Canada	0.1	-----	0.5	-----	-----	-----	0.6
Texas, Indiana, South Carolina, New Jersey, and Kentucky	0.2	0.1	0.2	-----	0.1	-----	0.6
TOTAL	18.9	0.7	28.5	7.0	6.8	38.1	100.0

*This quantity of lumber is known to be marketed out-of-state, but the specific state is not designated. It is reasonable to assume that distribution of this lumber would follow the same pattern as that for the known states.

†"Other," in most cases were sales through a broker.

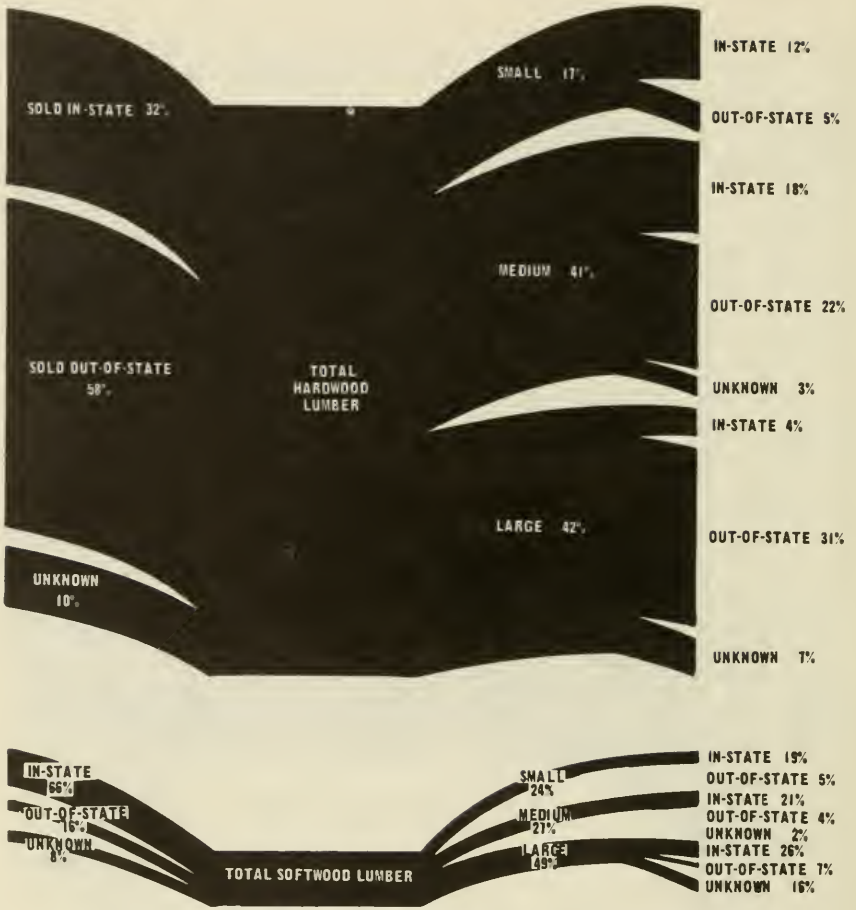


FIGURE 4. Marketing of lumber in-state and out-of-state by size of mill.

Table 3 also reveals that the largest volume of hardwood lumber was marketed directly to manufacturers. It is likely that manufacturers also absorb a large volume of the lumber reportedly sold to wholesalers and handled by brokers. Direct sales to manufacturers in Virginia and North Carolina alone accounted for more than 20 per cent of the out-of-state hardwood shipments. Of the states which border West Virginia, only Kentucky purchased an insignificant volume of West Virginia hardwood.

It is interesting to compare the actual distribution of lumber with a highly theoretical economic model developed by Holland and Judge (1963). By subtracting total consumption from total production, they estimated that West Virginia should have had an excess supply of 225

million board feet of hardwood lumber in 1958. Then, based upon transportation costs and hardwood lumber deficiencies in surrounding states, they theorized that hardwood lumber should flow from West Virginia to the following states:

185 million board feet to Ohio
40 million board feet to New York
—
225 million board feet total hardwood flow from West Virginia

Although the total volume of flow estimated by the model was nearly correct, Ohio and New York were *not* the states receiving large volumes of West Virginia lumber.

The three states to which most West Virginia lumber actually flows are Virginia, North Carolina, and Pennsylvania. Ohio and New York rank fourth and fifth. The model does not detect the actual flow because it lists Virginia, North Carolina, and Pennsylvania as already having a net surplus of hardwood lumber, therefore, these states would be expected to export rather than import lumber.

The obvious shortcomings of the theory are that individual states are not in themselves economic units. Even though a state's net hardwood lumber production is greater than its net consumption, it may still purchase hardwood lumber from other states. This is true for Pennsylvania, which produces more hardwood lumber than it consumes. Pennsylvania, in turn, markets its excess hardwood lumber primarily in Ohio and New York (Christensen and others, 1962). Thus, some of West Virginia's surplus hardwoods are marketed in Pennsylvania. This enables Pennsylvania to market more surplus hardwoods in Ohio and New York. So the flow determined by the theoretical model actually takes place, although not in as direct a manner as the model indicates.

A major challenge to West Virginia is to become a larger secondary manufacturer of wood products. This would reduce the flow of hardwood lumber from the State, resulting in increased value added by manufacture, greater local employment, and a broader industrial base. From a national and regional outlook, this should be accomplished without transferring unemployment to other states. Luring industry from other areas to West Virginia may help solve the State's problems but not the regional or national problems. Expansion of existing industry already located in West Virginia, expansion by regional or national firms into West Virginia, and the location of new industry within the State are possibly better solutions to the problem of excessive outflow of the State's lumber.

FIGURE 5. Total lumber marketed by type of market outlet and size.

Type of Outlet

Figure 5 shows the channels through which West Virginia lumber is marketed, combining both hardwood and softwood lumber and in-state and out-of-state outlets.

There appears to be little difference between the size class of firms regarding the type of outlet into which lumber is marketed. The manufacturer was the most important outlet for all size classes, followed by the

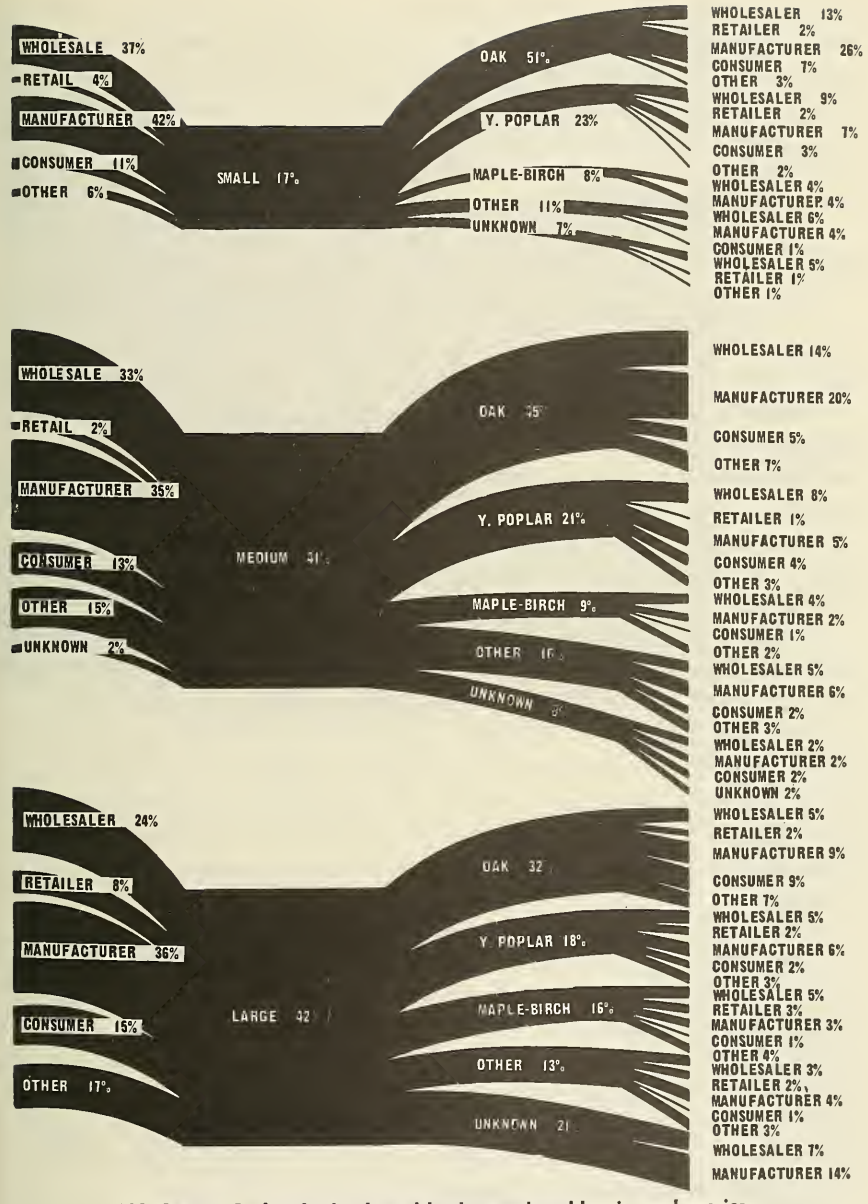


FIGURE 6. Outlets for hardwood lumber marketed by size and species.

wholesale outlet. The only large difference was in the larger proportion of lumber marketed to consumers by the medium and large sawmill firms.

As shown in Figure 6, which illustrates the marketing of hardwood lumber by different mill size classes according to outlet and species, the

wholesale outlet becomes less important for the large sawmills, probably because firms of this size often act as wholesalers. Comparisons among species show that oak lumber was the largest volume item in all three size classes, accounting for over one-half of the total in the small class and about one-third in the large class. The proportion of maple and birch marketed by the large firms, as noted, was considerably greater than for the two smaller size classes.

Grade

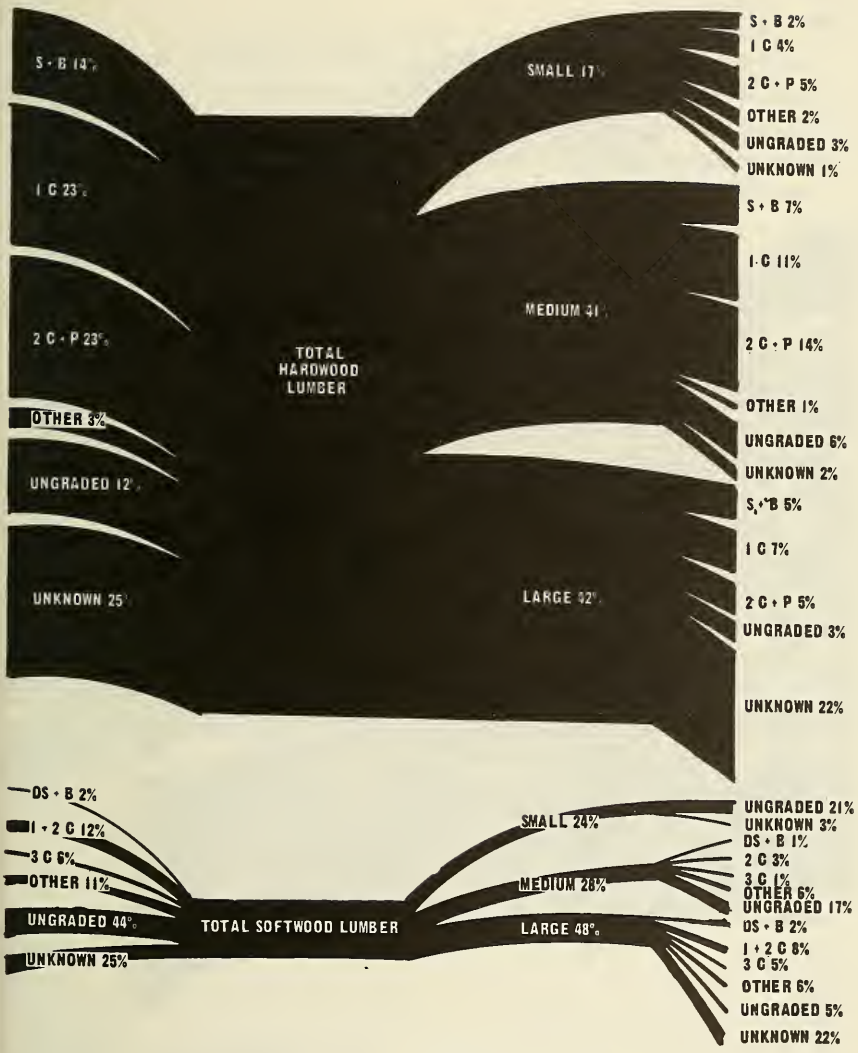
About 15 per cent of the hardwood lumber marketed by West Virginia lumber producers was in the "selects and better" grade (Figure 7). Ignoring the lumber of "unknown" grade, a larger proportion of "selects and better" was marketed by the larger firms. Also, the proportion of No. 1 common lumber was greater for these larger firms than for small firms. These large lumber producers also sold a higher proportion of high-grade lumber and, as shown in Figure 4, marketed the highest proportion of hardwood lumber out-of-state. For example, of the 217 million board feet of hardwood lumber sold out-of-state, nearly one-half was in the "selects and better" and "No. 1 common" grades.

Twelve per cent of the hardwood lumber was sold "ungraded." Although Figures 7 and 8 indicate that a high proportion of graded lumber was marketed by mills of all size classes, it is important to recognize that the actual grading was often done by the buyer rather than the seller—especially for sales by the small firms (Figure 11). In effect, the small firm sells lumber ungraded to the buyer, who grades it and pays for it upon the graded price. It is reasonable to assume that in some cases a firm could receive additional revenue by grading lumber prior to selling it.

While the amount of lumber actually sold by the small firms at ungraded prices was fairly low (11 million out of 64 million board feet), over one-third of the small mills sold in this manner, thereby tending to reduce their possibilities of receiving higher prices for graded lumber. Although Figure 7 shows that larger firms market a considerable volume of ungraded lumber, this does not typify marketing practices of the large sawmill firms. The ungraded lumber shown for large mills was all produced by one firm. This firm sold the lumber in rough green condition to a specific consumer for a particular end use.

Most of the softwood lumber produced by the smaller firms was of insufficient volume to justify grading. Large firms, however, usually did grade softwood lumber in addition to the hardwood lumber.

A larger proportion of high-grade lumber was marketed through wholesalers than through other outlets, presumably because wholesalers



LEGEND:

S & B	Selects and better	D S & B	D Selects and better
1C	No. 1 common	1 & 2C	No. 1 and No. 2 common
2 C & P	No. 2 common and poorer	3C	No. 3 common

FIGURE 7. Marketed lumber by grade and size.

prefer high-grade lumber which yields greater profits and the higher value products pay for the repeated handling involved.

Type of Manufacturer

Thirty per cent of the hardwood lumber marketed in this study was sold directly to manufacturers, and as was pointed out previously, a large proportion initially marketed through other outlets presumably ends up with the manufacturer (Figure 8).

As shown in Figure 9, which illustrates the types of manufacturing

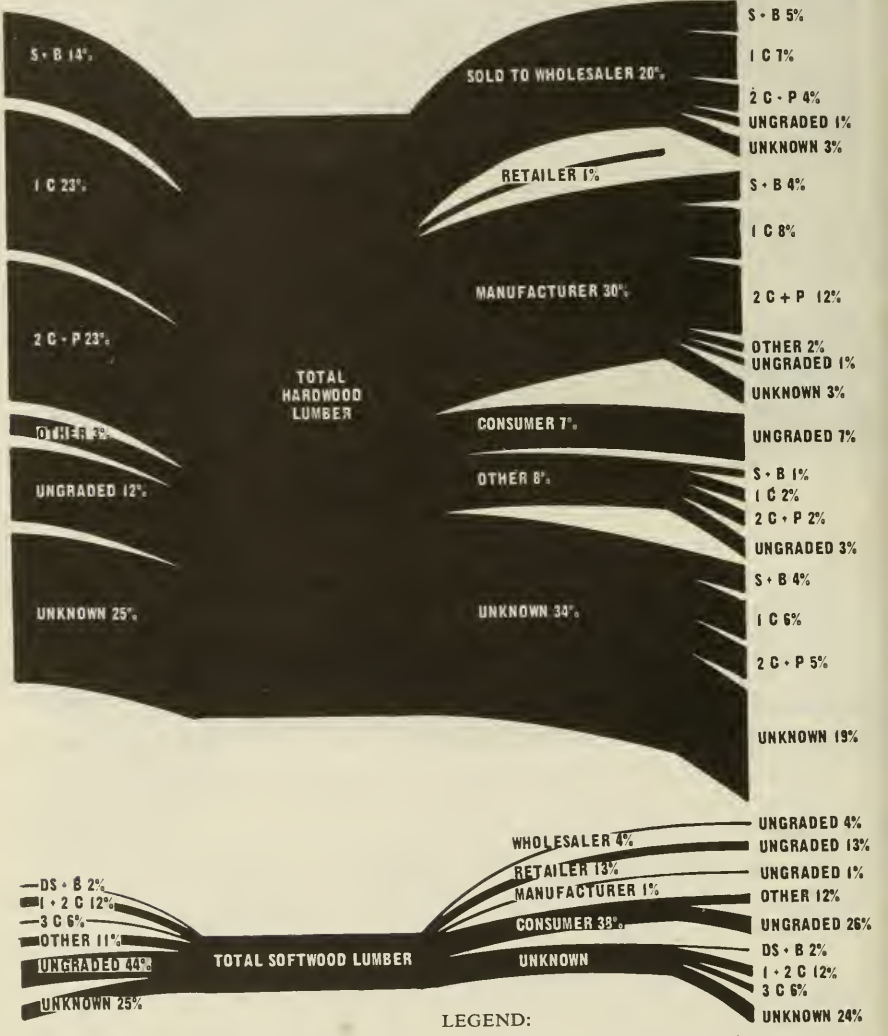


FIGURE 8. Market outlets for hardwood and softwood lumber by grade and type of outlet.

FIGURE 9. Lumber sold to manufacturers by type and size of manufacturer.

outlets into which hardwood lumber flows from West Virginia, furniture and flooring together accounted for over two-thirds of the total. Much of the hardwood lumber sold in-state was manufactured into flooring for which low-grade oak is satisfactory. A large proportion of the high-grade lumber, and considerable maple and birch, was marketed to out-of-state furniture manufacturers, principally because West Virginia is not a major furniture manufacturing state.

The relative proportion of lumber marketed to furniture manufacturers increases as the size of the firm increases. Conversely, the relative proportion used for flooring decreases as the size of firm increases. These relationships presumably exist because the large firms not only possess a greater knowledge than the small firms as to the location and variety of out-of-state outlets, but also because the large mills are in a position to satisfy the volume and grade requirements of large out-of-state manufacturer markets.

Prices Paid for Lumber Marketed

The average prices received for lumber, by marketing size class, are listed in Table 4. Included also are the Memphis prices from the *Hardwood Market Report* (1957) for the same grades and species.*

With but one exception (No. 2 common maple-birch), a consistent, upward progression of average price occurred with increasing size of firm. Moreover, only at the large mills did the average price compare closely with the Memphis price.

The differentials in price among mill size classes for the same species and grade of lumber imply that the bargaining position apparently becomes less favorable with decreasing mill size class.

In pure competition, when all producers have a perfect knowledge of all markets, there should be only one price for a given product. In the lumber market, there are many possible reasons for prices to differ. The degree to which prices for the same product diverge may be used as a rough indication of the imperfections of the market. Assuming that no seller is large enough to influence the price, that the product is homogeneous†, and that there are many buyers and sellers who know the price, there should be only one price. If this were true, there would not be as great a need for marketing research.

Table 5 shows that lower prices were received by firms in the smaller mill size-class. Also, firms receiving the lowest prices were normally those which had contacted few or no buyers. It appears that wholesalers actually pay less for lumber on the average, but there are some manufacturers who paid less than some wholesalers. However, over the total range of prices, those paid by manufacturers were considerably above those paid by wholesalers, especially when buying from the small firms. For example, the manufacturer buying FAS oak from firm No. 19 paid $30.00 per thousand board feet more than the wholesaler buying the same product from firm No. 7. Both the wholesaler and the manufacturer presumably will tend to buy lumber for as low a price as possible. However, the wholesaler usually is not in a position to pay as high a price as the manufacturer without foregoing some profit, since the wholesaler's existence depends upon the buying of lumber at below market

*A weekly newsletter which reports the selling price of hardwood lumber for reporting mills.

†This homogeneity cannot be assumed in all cases for lumber. One thousand feet of No. 1 common red oak, for example, is *not* a homogeneous product in that there are various intrinsic and real differences between similar units as produced by different sawmills. Such factors as color, texture, grain, uniformity of growth, specific gravity, region of growth, and others may cause price differences between what, on paper, is the same product. In this case, there may be a real difference in value.

TABLE 4

Prices Paid for Lumber Marketed by Marketing Size Class F.O.B. Price in Dollars per M Board Feet—Based on Rough Air-dried, 4/4 Lumber

Species Group and Grade	Size Class			Memphis Price* (Dollars)
	Small (Dollars)	Medium (Dollars)	Large (Dollars)	
Oak—FAS	140	167	209	200-220
Oak—No. 1 Common	86	96	116	115-120
Oak—No. 2 Common	56	59	68	67-67
Yellow Poplar—FAS	146	167	204	200
Yellow Poplar—No. 1 Common	90	103	131	132
Maple-Birch—FAS	181	210	250	240-270
Maple-Birch—No. 1 Common	113	128	153	150-165
Maple-Birch—No. 2 Common	61	59	70	75-105
Cherry—FAS	216	247	278	270
Cherry—No. 1 Common	136	158	185	185
Cherry—No. 2 Common	62	76	100	95

*From *Hardwood Market Report, Lumber News Letter.* Vol. XXXV, No. 38, Sept. 21, 1957, Memphis Tenn., p. 4, Appalachian Hardwoods.

price, and then re-selling to manufacturers at a price near to the market price. The manufacturer should be able to pay a price approximating that of the market, whether buying from lumber producers or from wholesalers.

The data shown in Table 5 contain some bias since each firm marketed all of its lumber through a single channel. Therefore, the price received was likely to be below normal because the firm apparently did not have the alternative of selling through other channels. For example, firm No. 20 sold No. 1 common oak to wholesalers for $50.00 per thousand board feet. This price is $65.00 to $70.00 less than the Memphis price, and $25.00 per thousand less than the price received for the same product by another firm listed in Table 5. Also, no other buyers were contacted by this firm. The interview with this firm revealed that no time was spent finding markets, and lumber was sold as soon as someone offered to buy it.

Effect of Grading and Marketing Effort Upon Price

Despite a great difference in price between grades, as shown in Tables 4, 5, and 6, some mills still sell ungraded lumber. Small firms receive an average price of $97.00 per thousand board feet for graded lumber and $60.00 per thousand board feet for ungraded lumber. The average price paid for ungraded lumber was actually lower than the

TABLE 5

Prices Received by Producers, and Number of Buyers Contacted, for Those Producers Who Sold Their Total 1957 Production to Either Wholesalers or to Manufacturers
(Price in Dollars per 1 M bd. ft., air-dried, F.O.B. Mill)

Size of Firm and Number	Number of Buyers Contacted*	*FAS Oak*		*No. 1 Common Oak*	
		Wholesalers Price†	Manufacturers Price†	Wholesalers Price†	Manufacturers Price†
Small Firms					
Firm No. 1	0	110	-----	80	-----
2	0	115	-----	75	-----
3	3	135	-----	80	-----
4	2	135	-----	90	-----
5	17	150	-----	90	-----
6	10	150	-----	80	-----
7	7	150	-----	85	-----
8	4	-----	95	-----	85
9	6	-----	125	-----	70
10	3	-----	125	-----	90
11	5	-----	125	-----	90
12	15	-----	130	-----	80
13	-----	-----	132	-----	82
14	2	-----	135	-----	87
15	-----	-----	140	-----	75
16	-----	-----	150	-----	-----
17	24	-----	167	-----	92
18	4	-----	170	-----	105
19	7	-----	180	-----	100
20	0	-----	-----	50	-----
21	0	-----	-----	-----	-----
22	0	-----	-----	-----	-----
23	0	-----	-----	-----	-----
24	4	-----	-----	-----	-----
Average Price		135	140	79	87
Medium-Sized Firms					
Firm No. 25	1	160	-----	80	-----
26	2	-----	135	-----	87
27	0	-----	150	-----	95
28	5	-----	-----	-----	-----
Average Price		160	142	80	91
Large Firms					
Firm No. 29	12	165	-----	90	-----
30	275	210	-----	120	-----
Average Price		188	-----	105	-----
Memphis Price		200-220		115-120	

$60.00 per thousand board feet for the medium and large firms, which reflects the "picking over" which had probably taken place. This represents a lower real value for the products rather than a weaker competitive position. A small firm which markets all lumber ungraded normally will

TABLE 5 (Contd.)

Size of Firm and Number		Number of Buyers Contacted*	No. 2 Common Oak		Ungraded Oak	
			Wholesalers Price†	Manufacturers Price†	Wholesalers Price†	Manufacturers Price*
Small Firms						
Firm No.	1	0	50	-----	-----	-----
	2	0	63	-----	-----	-----
	3	3	55	-----	-----	-----
	4	2	-----	-----	-----	-----
	5	17	70	-----	-----	-----
	6	10	45	-----	-----	-----
	7	7	-----	-----	-----	-----
	8	4	-----	50	-----	-----
	9	6	-----	52	-----	-----
	10	3	-----	52	-----	-----
	11	5	-----	65	-----	-----
	12	15	-----	58	-----	-----
	13	-----	-----	47	-----	-----
	14	2	-----	65	-----	-----
	15	-----	-----	-----	-----	-----
	16	-----	-----	-----	-----	-----
	17	24	-----	55	-----	-----
	18	4	-----	55	-----	-----
	19	7	-----	63	-----	-----
	20	0	40	-----	-----	-----
	21	0	-----	-----	40	-----
	22	0	-----	-----	55	-----
	23	0	-----	-----	-----	60
	24	4	-----	-----	-----	60
Average Price			54	56	48	60
Medium-Sized Firms						
Firm No.	25	1	50	-----	-----	-----
	26	2	-----	63	-----	-----
	27	0	-----	40	-----	-----
	28	5	-----	-----	-----	75
Average Price			50	52	-----	75
Large Firms						
Firm No.	29	12	70	-----	-----	-----
	30	275	70	-----	-----	-----
Average Price			70	-----	-----	-----
Memphis Price			67			

*Does not include the number of customers contacted.
†Dollars.

have some high-quality lumber mixed in. A large firm which grades most of its lumber will not usually sell ungraded lumber containing high-grade boards, but will remove the high-grade material first. The medium-sized firms received an average price for all graded lumber of $114 per thousand board feet and the large firms received $134 per thousand board feet. This indicates that small firms selling ungraded lumber for $60.00 per thousand board feet would, with a more favorable

market situation, sell the same lumber graded for about twice the price, assuming that the grade recovery in sawing resulted in approximately the same proportion of grade lumber.

It would seem reasonable to expect that as a firm spent more time in searching out markets for lumber, some increase in average lumber price received would occur. This relationship is implied in Table 6, and indicates that the prices approached the Memphis price with increasing time spent searching out markets. However, the data shown in Table 6 should not be construed to automatically mean that any producer who spends over 40 hours per month to find markets will be able to sell at prices near the market price, because other factors also enter into price as, for example, the difference in marketing skills and in knowledge of marketing prices. For example, one producer in this survey spent 53 hours per month marketing 940,000 board feet of lumber. He sold most of his lumber through wholesalers. His marketing effort consisted of contacting about 25 of these wholesalers. As a result, he received $190 per thousand board feet for FAS oak and $100 per thousand board feet for No. 1 common. These prices approach the Memphis price. Another producer with a similar lumber volume and marketing effort, also contacted 25 wholesalers. He received $125 per thousand board feet for FAS oak and $75.00 per thousand board feet for No. 1 common. In these cases, the producer receiving the higher price sold his entire production based on an established market price, whereas the producer receiving the lower price sold his total production at a price established by the buyer of the lumber. In every case, in Table 6, the average price received under marketing effort of "over 40 hours" was greater than the price under the "1-to-10 hour" category.

Bargaining Position

One indication of the relative bargaining position of firms is the basis upon which prices are determined. As shown in Figure 10, a majority of small and medium firms in this survey sold their lumber at a price established by the buyer, whereas most of the large firms sold their lumber for the seller's price. A compromise price was common only in the medium units which apparently are large enough to attract the competition of several buyers, but not large enough to set the price. The market price was fairly common in the large and medium mills, but not in the small mill-class.

It would seem logical that the price offered by the buyer would be the lowest price received by those selling lumber; the market price and the seller's prices would be the highest, and the compromise price would fall some place in between. This relationship was tested by using

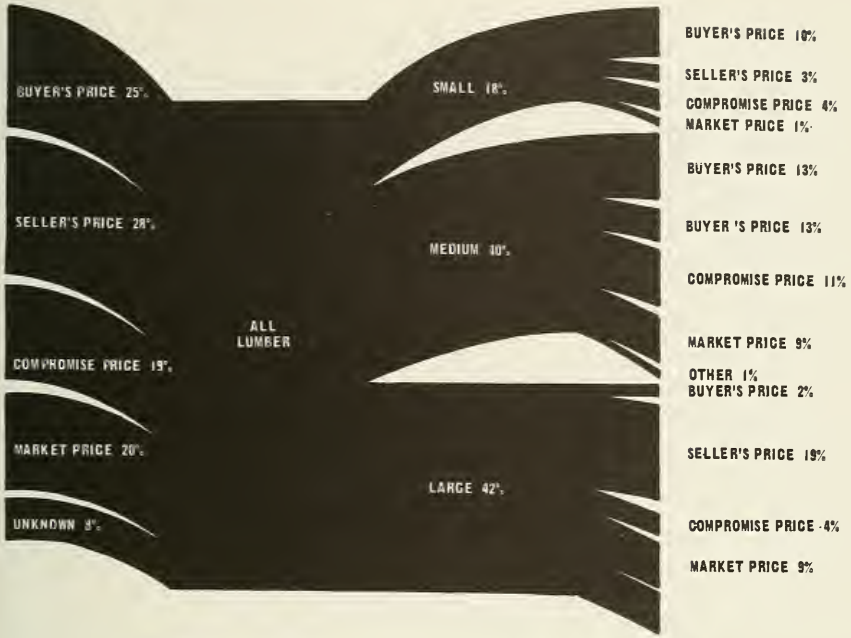


FIGURE 10. Price basis for lumber marketed by marketing size class.

the firms in the survey which sold their total volume based on a buyer's price, a seller's price, a compromise price, or a market price. The firms which sold entirely on the buyer's price received an average of $141 per thousand board feet for FAS oak. The firms which sold on a compromise price received an average of $161 per thousand board feet, and those selling their entire volume for a market price averaged $188 per thousand board feet for the same species and grade of lumber. A few firms which sold exclusively at their own (i.e., seller's) price received an average of $172 per thousand board feet. Of course, many other firms sold part of their lumber at a compromise price, part at market price, and part at seller's price. However, in general, the assumption that market price and seller's price will be highest seems to be valid. The problem of the small firm appears to be one of obtaining sufficient bargaining power to demand the market, or the seller's price, for a relatively small volume of lumber sales.

Method, Type, and Terms of Sale

The most common sales method for all size classes was sale from stock. For the small firms, almost one-third of the lumber marketed was sawn *after* the order, but this proportion decreased to 10 per cent for the large firms.

TABLE 6

Prices Paid for Lumber Marketed by Time Spent Finding Markets F.O.B. Prices in Dollars per 1 M bd. ft.—Based on Rough, Air-dried, 4/4 Lumber

(Time spent finding market in hours per month)

Species Group and Grade	0 Hrs.	1-10 Hrs.	10-40 Hrs.	Over 40 Hrs.	Memphis Price*
			Dollars		
Oak—FAS	136	163	162	197	200-220
Oak—No. 1 Common	85	90	91	120	115-120
Oak—No. 2 Common	51	60	56	65	67-67
Yellow Poplar—FAS	138	157	160	194	200
Yellow Poplar—No. 1 Common	80	103	102	123	132
Maple-Birch—FAS	174	197	207	225	240-270
Maple-Birch—No. 1 Common	107	122	127	134	150-165
Maple-Birch—No. 2 Common	51	62	60	65	75-105
Cherry—FAS	160	231	252	255	270
Cherry—No. 1 Common	110	146	167	167	185
Cherry—No. 2 Common	----	66	77	83	95

*From *Hardwood Market Report, Lumber News Letter.* Vol. XXXV, No. 38, Sept. 21, 1957, Memphis, Tenn., p. 4, Appalachian Hardwoods.

Cash sales were used most often, with payment requested within 30 days. Over 90 per cent of the sales was for cash. There were a few sales on consignment, bill-of-exchange, and deferred settlement. No forward selling or future contracts were recorded.

Terms of sale, as used here, refers to agreements between buyer and seller. Most sellers marketed lumber by a variety of agreements. The most common sales agreement was for the seller to deliver a specified quantity of lumber at intervals as requested by the buyer; however, only 10 per cent of sales was on this basis. Several firms agreed to sell their total production for a specified period of time to a given buyer. Of the several firms which had this agreement, some sold their total production year after year to the same buyers, while others entered this agreement for shorter periods of time.

Reasons for Selling to Buyers

The sellers in this study were confronted with a list of 12 reasons why they might sell to a certain buyer. They were asked to rate their reasons numerically: 1, 2, 3, etc., according to the most important reason. Table 7 summarizes the information gathered, according to frequency with which any one reason was given, and according to frequency with which a reason was listed as the most important.

TABLE 7

Reasons for Selling to Buyers as Given by Firms Surveyed

Reason	Small Firms		Medium-Size Firms		Large Firms	
	Listed as most important	Total times listed	Listed as most important	Total times listed	Listed as most important	Total times listed
Best Price Offered	28	44	17	23	1	4
Buyer Pays Cash Upon Delivery	7	32	2	19	—	1
Buyer Pays Cash Within a Certain Time Period	2	8	2	9	—	2
Buyer Comes to the Mill	4	11	1	6	—	1
Long-Standing Business Connection	6	17	7	17	—	4
Companies' or Buyers' Reputation	5	21	8	21	5	5
Buyer Purchases on Grade	1	6	1	8	1	2
Buyer Will Take All Grades	4	16	—	2	—	1
Can Usually Sell to Buyer When Market is Poor	2	15	1	10	—	1
Friendship with Buyer	—	2	—	—	—	—
Only Buyer Known	2	2	—	1	—	—
Other	4	12	2	3	—	—
TOTAL	65	186	41	119	7	20

The most important reason for selling to certain buyers given by the small and medium firms was that they offered the best prices. In contrast, the buyer's reputation was the reason given most often by the large firms. A buyer who pays cash upon delivery was rated as the next most important reason for selling to a certain buyer by the small firms, a consideration not so important to the larger firms. Small- and medium-size firms listed long-standing business connections and buyer's reputation as other important reasons. Some small mills sold to a particular buyer because he would come to the mill, or because he would take all grades. A reason often listed by small mills was that they could usually sell to this buyer when markets are poor, therefore, they sell to him when markets are good to protect this advantage.

Grade and Volume Determination

Lumber is sold by grade and by board foot volume of the individual boards. Determination of these is the function of the lumber grader. The hardwood lumber is graded by National Hardwood Lumber Association rules. With the exception of the small amount of lumber sold by special grades, listed as "other" in Figures 7 and 8, the major volume is graded and measured by Association rules. For the protection of

buyers and sellers the Association has a re-inspection clause, whereby any buyer or seller may contest the grade or volume as determined by the grader. The Association will then re-inspect the lumber, and if an actual mistake has been made, the necessary adjustments between buyer and seller will be made.

Figure 11 shows, by marketing size class, who measures and grades the lumber marketed by West Virginia producers. As indicated, most of the lumber marketed by the small firms and a large volume of lumber marketed by the medium firms is measured and graded by the buyer's grader, who is often a non-certified grader. This places these firms at a disadvantage in that they sell on the basis of grade and volume as determined by the buyer. Of course, the seller can always contest the grade and volume determination, but this is risky, since the entire cost of Association regrading is borne by the contesting firm, if the grade is upheld.

Almost all of the lumber sold by the large marketing units is sold on the seller's grade determination. This is more likely to represent the true grade and volume of the lumber, especially since much of this is graded by certified Association graders. In most cases, the buyer will regrade some or all of the lumber as a check on the seller's grader, and this may result in a dispute in which the Association becomes an arbitrator.

Inventory on Hand

The primary reasons for holding inventories of lumber are to add value by air drying, to accumulate a marketable quantity, and to wait for more favorable market conditions. The firms in this study were asked to give their minimum and maximum yard stocking, and the basis used for determining the maximum volumes of inventory they would carry. No distinction is intended here between inventory and yard stocking although the process of air drying, which ties up large volumes of lumber in the yard, could conceivably be considered as a final step in processing rather than a part of the inventory.

Small firms listed an average of 13,000 board feet minimum and 62,000 board feet maximum yard stocking. Over two-thirds of these firms, however, allowed inventories to drop to zero sometime during the year. The basis for determining the volume of inventory a firm could carry was obtained by asking an open-end question. For most of the small firms, capital limitations were said to govern inventories. A common answer given was, "I sell green lumber to avoid tying up capital in my drying yard." One producer indicated that he sold green lumber because he

FIGURE 11. Proportion of lumber measured by buyer, seller, or unknown by size class.

needed money for the payroll. Another said, simply, "A little man can't carry it." Another common method of determining inventory for this small-size class was based on local market conditions If the price offered was too low, the lumber was kept in inventory until the price improved, or until the firm was forced to sell in order to pay operating costs. Some producers indicated an insufficient price difference between green and air-dried lumber to justify holding lumber in stock for yard drying. Other firms, which considered air-drying profitable, indicated that the volume held in their yard stocks was determined by how long it took the lumber to air-dry, which depends upon the season and species.

Medium-size firms held an average of 233,000 board feet inventory minimum, and 582,000 board feet maximum. Only 20 per cent of these firms allowed their inventories to drop to zero. The maximum yard stocking was determined primarily by market conditions and the space available in the yard. Capital was also a factor; several producers indicated that the maximum yard stocking was reached when the money in their personal bank account dropped to a certain low balance.

The inventories of large firms ranged from a low of 3.5 million board feet to a high of almost 7 million board feet. All of the firms maintained substantial inventories. Market conditions formed the basis for determining the maximum yard stocks to be held by most firms. Under favorable market conditions, inventories would fall toward the minimum. The firm would then increase production by adding a shift, by overtime, or by an extra workday per week. If market conditions were unfavorable, inventories would rise toward the maximum, and the firm would respond by slowing down production.

One firm indicated that during the unfavorable marketing conditions of the depression years, over 30 million board feet of lumber were held in the yard. This was equal to the total production of several years. Obviously, only a firm with large capital reserves could weather such market conditions. The average price of oak in West Virginia in 1928 was over $46.00 per thousand board feet. By 1932 this price had fallen to $32.00 per thousand board feet, and it remained low until 1941 (Steer, 1948).

Small firms that lack the capital needed to hold large inventories are placed at a marketing disadvantage. The producer who needs to sell green lumber to pay wages is not in a favorable bargaining position. This producer was forced to sell all species for the same price—$135 per thousand board feet for FAS grade. Although he marketed a considerable proportion of the higher priced species such as yellow-poplar, maple, birch, and basswood, he received less than the average price received by the small firms for oak, as given in Table 4.

Conclusions

The data presented in this study underscore the relatively weak market position of small sawmill owners in West Virginia. These owners often lack knowledge of markets for their lumber and generally must accept buyers' estimates of lumber volume and grade, as well as buyers' prices. This condition is further compounded by lack of capital resources of a majority of the small mills.

Assuming that small sawmills continue to exist, although probably in decreasing numbers over time, the question arises as to what action can be taken to strengthen their relative position in the lumber market. Possibly the first step should be in the direction of education, i.e., providing such mill owners with information on the various existing markets for their lumber and the prices being paid in these markets. Such information is necessary for the decision-making process—the less informed the seller, the less the possibility of his making the most profitable decision regarding the marketing of his product.

Whitmore concludes a Northeastern regional lumber marketing study by pointing out that the large firms are able to spend more time and money on marketing activities. This segment of the industry is therefore closer to the ideal market situation than the segment which does not seek out markets. "A free economy does not function properly when market information is lacking on the part of the buyer or seller. Therefore, it would seem to be a legitimate function of marketing research to make information available, particularly to the small producer, if for no other reason than to convince him that perhaps he is not a competitive unit. This would furnish an incentive for some types of integration or cooperative marketing" (Whitmore and others, 1963).

General recommendations as to production and marketing of the maximum amount of grade lumber are difficult to make without further research. For example, it is possible that small producers may maximize profits by selling all lumber on a mill-run basis. By so doing, the extra costs of sawing, grading, sorting, and handling, and the costs of holding capital (particularly low-grade lumber) are not incurred. On the other hand, it is possible that the additional returns resulting from grading may sufficiently offset the additional costs, providing a higher net return to the operator. Questions such as these suggest areas in which future research might provide fruitful results.

During the survey, an almost universal complaint was made by mill owners producing and marketing lumber for grade—the difficulty of

selling, at a profit, the lower grades of lumber (No. 2 common and poorer for hardwoods and No. 3 common and poorer for softwoods). It is likely that this particular problem will continue until such time as new markets are created for low-quality lumber. And this, again, suggests the potential contribution of further research, not only on profitable utilization of low-grade lumber but also in the area of new wood-product development, particularly new products which can be manufactured from low-grade lumber.

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